DOCUMENT RESUME

ED 391 424 HE 028 860

AUTHOR Dekin, Bonnie J.; And Others
TITLE Condom Use in College: Students' Self-Protection against HIV. ASHE Annual Meeting Paper.
PUB DATE Nov 95
NOTE 29p.; Paper presented at the Annual Meeting of the Association for the Study of Higher Education (20th, Orlando, FL, November 2-5, 1995).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Acquired Immune Deficiency Syndrome; *College Students; Disease Control; Epidemiology; Health Promotion; Higher Education; Knowledge Level; *Sexuality; Socioeconomic Influences; *Student Attitudes; *Student Behavior
IDENTIFIERS *ASHE Annual Meeting; *Condoms

ABSTRACT

This study examined condom use by college students and factors associated with consistent condom use. It is based on a survey of 212 sexually active residential students at a major eastern doctoral granting institution conducted in the spring of 1994. The survey found that a substantial number of sexually active students were engaging in behaviors that put them at high risk for human immunodeficiency virus (HIV) infection. It found that nearly two-thirds did not consistently use condoms during sex, and that an equivalent percentage reported consuming alcohol or using drugs in situations potentially leading to sexual intercourse. These results were considered surprising in view of the high knowledge level the students displayed in regard the causes of HIV. Students also reported low self-perceptions of risk for contacting HIV. The study also found that race, gender, parental education level, and family income were not related to condom usage. It concludes that while college students have a high awareness level of the causes of HIV infection and acquired immune deficiency syndrome (AIDS), they are not likely to adopt HIV-safe behaviors. The implications for HIV/AIDS education programs are discussed. (Contains 39 references.) (MDM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 391 424

CONDOM USE IN COLLEGE: STUDENTS' SELF-PROTECTION AGAINST HIV[1]

Bonnie J. Dekin
University at Albany

Alberto F. Cabrera
University at Albany
School of Education, Room 326
1400 Washington Ave.
Albany, NY 12222
(518) 442-5086

W. Paul Vogt
University at Albany
School of Education, Room 313A
1400 Washington Ave.
Albany, NY 12222
(518) 442-5095

J. Fredericks Volkwein
University at Albany
Administration, Room 241
1400 Washington Ave.
Albany, NY 12222
(518) 442-5413

HE 028 860

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
✓ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

ASHE

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC).

[1] *Paper presented before the 1995 ASHE meeting in Orlando, Florida. This manuscript is dedicated to the memory of Bonnie J. Dekin.*

ASHE

ASSOCIATION
FOR THE
STUDY OF
HIGHER EDUCATION

Texas A&M University
Department of Educational
Administration
College Station, TX 77843
(409) 845-0393

This paper was presented at the annual meeting of the Association for the Study of Higher Education held at the Marriott Hotel, Orlando, Florida, November 2-5, 1995. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

CONDOM USE IN COLLEGE: STUDENTS' SELF-PROTECTION AGAINST HIV

ABSTRACT

Condom use by college students and factors associated with the consistent use of condoms were examined in a sample drawn from residential students attending a major eastern institution in the Spring of 1994. Predictor variables included: a) use of drugs or alcohol, b) background characteristics (gender and ethnicity), c) socioeconomic status measures (parental education and family income), d) knowledge of how AIDS is transmitted, e) social norms, f) self-perceptions of risk of HIV infection, and g) self-efficacy perceptions. Consistent use of condoms was the criterion measure. Some of the main findings were: (1) high-risk behaviors are widespread even among knowledgeable students, (2) systematic use of condoms is independent of a student's SES and background characteristics and his/her amount of knowledge about HIV, (3) students do have low perceptions of risk of contracting HIV, and the lower these perceptions of risk are the more likely it is for them not to consistently use condoms, and (4) the factor that contributes the most to the use of condoms is self-efficacy perceptions.

CONDOM USE IN COLLEGE:

STUDENTS' SELF-PROTECTION AGAINST HIV

AIDS is the sixth leading cause of death among people aged 15 to 24 (Morbidity and Mortality Weekly Report, 1992). One quarter of reported AIDS cases are found among the 20 to 24 year old cohort alone (Jurich, Adams & Schulenberg, 1992). And yet, however grim this statistical picture may be, this dreadful profile may actually underestimate the full scope of the problem; statistics do not include individuals who although infected have not shown AIDS related symptoms. Kipke and Hein (1990) estimate that the number of adolescents diagnosed with AIDS doubles every fourteen months.

College students are particularly vulnerable to contracting HIV infections. Some research indicates that college students are likely to engage in such behaviors as unprotected sexual intercourse, inconsistent use of condoms, multiple partners, sexual experimentation and the use of alcohol and other drugs (MacDonald et al., 1990) all of which are known to increase the chance of contracting HIV (Healton, 1991; Main, Iverson & McGloin, 199; Ward, 1989; Wasserheit & Ehrhardt, 1991).

Because AIDS is deadly and its spread is largely preventable, it is extremely important for college administrators to discover and understand the factors that influence students to adopt safe behaviors. This knowledge could assist campus administrators in the implementation of programs and services for educating students on how to protect their health.

The purpose of this study is twofold: (1) to document the extent to which college freshman who are sexually active consistently use condoms, a behavior shown by research to reduce the risk of acquiring HIV infection; and, (2) to determine which psychosocial factors are more

likely to increase the probability of consistent use of condoms.

Perspective

This study builds upon Bandura's social learning theory (1977, 1986, 1992), Becker et al.'s health belief model (1974), Ajzben and Fishbein's theory of reasoned action (1980) and Fisher and Fisher's information, motivation, behavior model (1992). These perspectives were chosen in view of their documented validity in predicting the adoption of HIV-safe behaviors (e.g. Bandura, 1992; Brown, et al., 1991; Carmel, 1990; Cochran et al., 1992; Fisher & Fisher, 1992; Rosentock, Strecher & Vecker, 1988).

In accordance with these perspectives, the adoption of HIV-safe behaviors among college students is seen as the outcome of five major factors: 1) background characteristics, 2) use of drugs and/or alcohol in situations that might lead to sexual intercourse, 3) information or knowledge about HIV transmission and risk reduction strategies, 4) perceptions of risk, and 5) self-efficacy perceptions.

As it applies to the HIV field, social cognitive theory (Bandura, 1992) views decisions to engage in HIV-safe behaviors as the outcome of a person's self-perceived ability to initiate and persist in strategies that lead to the adoption of the HIV-safe behavior (also referred as self-efficacy perceptions). Advocates of the theory of reasoned action add several psychological variables. Two of the most salient are: a) individual perceptions of risk (e.g., Becker et al., 1974; Boyer & Kegles, 1991; Brown, DiClemente & Misovich, 1990; Fishbein et al., 1992; James et al., 1991), and b) perceived social norms related to HIV and protective behaviors (e.g. Bandura, 1992; Basen-Engquist & Parcel, 1992; Fisher, 1988; Fisher & Fisher, 1992). While acknowledging the role of self-efficacy perceptions, perceptions of risk and perceptions of

friends and sexual partners' social norms, Fisher and Fisher (1992) believe that the extent to which a person is knowledgeable about HIV transition and risk reduction strategies can also help to predict whether the adoption of safe behaviors would occur. They also argue that the likelihood of adopting HIV-safe behaviors is enhanced to the extent to which a person has positive attitudes towards the protective behavior. Finally, research on HIV has found that adoption of HIV protective behaviors appear to be also affected by gender, ethnicity and socioeconomic background (e.g., Aral et al., 1991; Ehrhardt & Wasserheit, 1991; Main, Iverson & McGloin, 1994; Peruga & Rivo, 1992).

Methodology

Subjects

The sample was drawn from residential students attending a major eastern doctoral granting institution during the spring of 1994. Of the original sample (n = 265), eighty two percent described themselves as sexually active (n = 212). The sexually active sample was predominately White (72.1%)[2] and almost evenly split by gender (50.7% male and 49.3% female). The majority were freshman (67%) and had a mean age of 19. The sample was dominated by students from relatively high socioeconomic backgrounds. The majority (82%) reported parental education levels higher than a high school diploma, and the median family income fell in the $50,000 to $69,000 range (see Table 1). These statistics are consistent with institutional records indicating that the sample is representative of the target population.

---

[2]The other ethnic groups were African-American (7.4%), Hispanic (7%), Native American (.9 %), Asian-American (3.7%), and Other (8.8%).

Variables and Measures

Four of the scales contained in the Sexual Opinion Questionnaire (Fisher 1992) were used to operationalize the constructs of: a) knowledge, b) subjective or social norms, c) perceptions of risk, and d) self-efficacy perceptions. These scales were chosen in view of their reliability and predictive power (see Fisher & Fisher, 1992)[3]. Several discussions were held with Dr. Jeffrey Fisher and his research assistant Stephen Misovich concerning the application of and modifications to the instrument. Several focus interviews with a representative sample of residential students were conducted to enhance the content validity of the items as they apply to college students[4]. Experts in HIV prevention education, residential life administrators, public health administrators, and scholars on public health were also consulted. Some items were modified as a result of this process.

Condom Use. Consistent use of condoms was the dichotomous dependent variable. Students who indicated in a Likert scale -ranging from 1 (always) to 5 (never)- that they always used condoms while having sex were coded as 1, otherwise coded 0. This behavior was chosen

[3]Although the Fisher's instrument contains an "attitude" component presumed to predict adoption of HIV-safe behaviors, the scale was not included in this study. A close examination of the items comprising the scale reveals that they inquire about respondents' actual behaviors (condom use) rather than about their attitudes towards the HIV-safe behavior. The use of this scale would have confounded the results.

[4]Two types of focus groups were used to enhance the content validity of the scale. The first set of focus groups, created in terms of gender, was presented with several open-ended questions seeking to elicit information about HIV-related knowledge, motivation to adopt HIV-safe behaviors and behavior skills that were most salient to them. Ajzen and Fishbein (1980) have suggested that researchers rely on focus groups with a representative sample of the target population to elicit content valid information. A second focus group was asked to review the items comprising the Sexual Opinion Questionnaire (Fisher 1992) and to indicate the extent to which the wording was understandable.

and coded dichotomously because *consistent* condom use has been shown to be crucial to reduce the risk of acquiring HIV infection (e.g. Jemmot et al., 1992; Rosentocock et al., 1988).

Drugs or Alcohol. Students who indicated that they drank alcohol, smoked marijuana or used other mind altering substances in situations that might lead to sexual intercourse were coded as 1, otherwise coded 0. Fisher and Fisher (1992) have argued that the adoption of HIV-safe behaviors is most likely to occur when individuals refrain from alcohol or substance use in situations that might lead to sexual intercourse.

Background characteristics. Gender (1=Males, 0=Females) and Ethnicity (1=Whites/Asians, 0=Others) were used to measure background characteristics. Asian-Americans and Whites were collapsed into a single category since no statistical differences were observed in their use of condoms (chi-square=.099, df=1, p-value=.753) . Sample size restrictions prevented the disaggregation of the analysis into several ethnic groups.

Socioeconomic status (SES). Subjects' reports of their parents' highest level of education and their family income were used to measure this construct. The parental education scale ranges from 1 (high school or less) to 4 (graduate studies). The family income scale ranges from 1 (less than $9,000) to 8 ($150,000 or more).

Knowledge about HIV. This scale is based on a nine-item true/false test containing questions specific to sexual transmission of HIV and related protective behaviors. These nine items were derived from Kelly, St. Lawrence, Hood and Brasfields' (1989) AIDS risk behavior knowledge scale[5].

---

[5]The original 40 item scale was developed for use with gay men and college students. The nine items that were selected assess general knowledge about how HIV is transmitted and about the behaviors that can prevent individuals from contracting the virus regardless of the sexual

Risk perceptions. This scale is made up of four items which together assess perceptions of risk for contracting HIV. Three of these items capture self-assessments of the likelihood of contracting HIV in relation to: a) present and past behavior, b) average college students, and c) close friends. The scale also contains an omnibus item assessing self reported chances of having been already infected.

Subjective Social Norms. The subjective social norms scale is made up of four items that specifically capture a subject's perceptions of friends' and sexual partners' norms concerning condom use.

Self-Efficacy. The self-efficacy scale is comprised of six items that inquire whether the students who wish to engage in safe behaviors believe it would be possible for them to do so.

Items corresponding to Subjective Norms and Self-Efficacy were measured via a Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). These items were subsequently reversed recoded whereby the higher the score represents the higher the level of agreement. Negatively worded items were re-scaled to maintain consistency. Since scale scores were produced for each scale based on averages across respective items, the scale scores for Subjective Norms, Risk Perceptions and Self-Efficacy range from 1 to 5. The range of scale scores for Knowledge fall within the 0 to 9 boundary. Table 1 displays summary statistics and scale reliabilities.

Analyses

Logistic regression was used to assess the effect of use of Drugs/Alcohol, background characteristics, SES, knowledge, social norms, perceptions of risk and self-efficacy perceptions

---

orientation of the respondent.

on the likelihood of adopting HIV-safe behavior. The selection of this technique over ordinary least squares (OLS) was guided by several considerations. Logistic regression not only captures the probabilistic distribution embedded in dichotomous variables, but it avoids violations of the assumptions of homogeneity of variance and functional specification that the direct application of either OLS or HLM to dichotomous variables is likely to produce (Aldrich & Nelson, 1985; Hanusheck & Jackson, 1977). Since logistic regression is a non-parametric technique, it is also less sensitive to violations of the assumption of multivariate distribution as compared to OLS, HLM and discriminant análysis. Furthermore, Press and Wilson (1978) demonstrated that logistic regression is a better procedure than discriminant analysis for both prediction and classification purposes.

Following recommendations by Cabrera (1994) and Feinberg (1983), model testing was conducted at two levels. First, a test for significant changes in G^2 (scaled deviance) was used to assess the contribution of each variable in predicting adoption of HIV-safe behavior. The change in G^2 is similar in interpretation to the change in R^2 of OLS, except that a lower G^2 value signifies that the variable under consideration contributes to the explanation of the criterion (Cabrera, 1994). At the second stage, several goodness-of-fit measures were employed to assess the model per se. These included the model chi-squared[6], the proportion of cases correctly predicted (PCP)[7] by the model, the G^2/df [8] ratio and the pseudo-R^2 [9]. Peterson's (1985) delta-p

---

[6]The model chi-square assess the extent to which predictor variables are statistically associated with the dependent variable (see Aldrich & Nelson, 1986; Cabrera, 1994).

[7]The PCP assess the extent to which the model correctly predicted cases; values for this indicator of fit can range from 0 -lack of fit- to 100 -perfect fit- (see Aldrich & Nelson, 1986; Cabrera, 1994).

($\blacktriangle$P) was used to assess the marginal contribution of each predictor to the likelihood of adopting the HIV-safe behavior[10].

Results

Reliabilities of the four scales ranged from moderately low (.63) to high (.81). These reliabilities are .81 for (a) knowledge of HIV, .63 for (b) subjective or social norms, .75 for (c) risk perceptions, and .72 for (d) self-efficacy perceptions (see Table 1).

Insert Table 1

A substantial number of the sexually active students are engaged in behaviors that place them at high risk of HIV infection (see Table 1). Nearly two-thirds (62.4%) did not consistently use condoms during sex. Sixty four percent reported consuming alcohol or using drugs in situations potentially leading to sexual intercourse. The preponderance of these two behaviors is surprising in view of the high knowledge the average student had regarding factors leading

---

[8]The G^2/df assesses the extent to which the model fits the data; G^2/df ratios less than 2.5 are usually regarded as good indicator for the fit of the model (see Stage, 1990; Cabrera, 1994).

[9]In multiple regression, the R^2 represents the proportion of variance explained by the independent variables. In the multiple logistic regression context, the pseudo-R^2 represents the proportion of error variance controlled by the model; this indicator can range from 0 (no error variance controlled for) to 1.0 (all error variance accounted for). The merit of the pseudo-R^2 rests on its ability to provide an additional indicator of how good a model is in relation to an alternative one (see Aldrich & Nelson, 1987; Maddala, 1987; Cabrera, 1994).

[10]Although several methods exist to assess the marginal contribution of predictors, Peterson (1985) demonstrated that these procedures overestimate the marginal effect of the variable. The delta-p controls for over-estimation effects while providing conservative estimates of the effect of the predictor measures.

to HIV (mean of 7.2 out of 9, or 80 percent correct). On the other hand, students on average reported low self-perceptions of risk for contracting HIV (mean of 1.83 out of a possible score of 5), had moderate levels of self-efficacy perceptions (mean of 3.42 out of a possible score of 5), and reported being moderately influenced by social or subjective norms (mean of 3.5 out of a possible score of 5).

Use of alcohol or drugs was found to be inversely associated with the adoption of the HIV-safe behavior; only thirty one percent of the students consuming drugs or alcohol reported always using condoms (see table 2). However, the adoption of the HIV-safe behavior was found to be independent of either a students' background characteristics or socioeconomic origin (see table 2). Both males and females showed similar propensities to always use condoms (36.4% vs 38.7%). No significant differences were noted between minorities and non-minorities (39.2% vs 37.5%). The proportion of condom use remained fairly constant across each of the four levels of parental education. Similar trend was observed for family income. While perceptions of risk and self-efficacy perceptions were found to be significantly associated with condom use, the amount of knowledge a student had about how HIV is transmitted showed no association with his/her condom use behavior (see table 2).

Insert Table 2

Seven hierarchical logistic regression models were estimated to assess the relative contribution of each factor in predicting HIV-safe behavior. The first section in Table 3 reports the extent to which the variable significantly contributed to fit results as evinced by chi-squared

changes. The second section reports the four measures of fit for the corresponding logistic regression model. Results of the logistic regression hierarchical model largely reproduced the bivariate analyses. Chi-squared change statistics indicated significant improvement of fit results for adding use of Alcohol/Drugs (chi-squared change= 5.83, df=171, p-value < .05), Subjective Norms (chi-squared change= 9.62, df=166, p-value < .05), Perceptions of Risk (chi-squared change= 9.30, df=165, p-value < .05), and Perceptions of Self-Efficacy (chi-squared change= 18.15, df=164, p-value < .01). Of these four models, the Self-Efficacy model yielded the highest reduction in chi-squared change. The model also has the highest significant association with the criterion variable (X^2 = 43.47, df=9, p-value <.01). In addition, it correctly predicted systematic use of condoms for 71.7% of the sample. This model also yielded the highest reduction in prediction error (pseudo-R^2 = 20.0%) and its G^2/df ratio of 1.15 was well below the recommended threshold of 2.5 (see Cabrera, 1994).

Insert Table 3

Seven of the predictor variables did not attain conventional levels of statistical significance in the final model (see column VII in table 4). The two background variables (gender and ethnicity) and the two socioeconomic factors (parental education and family income) were not found to be associated with the probability that an undergraduate student would use condoms across each of the six models in which these variables were incorporated (see columns II through VII in table 4). Likewise, knowledge of how HIV is transmitted failed to affect the likelihood that a student would consistently use condoms in each of the three models in which the variable

was included (see columns V, VI and VII). Net of the effects of background characteristics, SES factors, cognitive and motivational factors, the use of alcohol or drugs were not found to exert a significant direct effect on condom use (see column VII). This finding is quite interesting particularly since this behavior significantly predicted condom use even after controlling for background characteristics, knowledge and social norms (see models II through V). Only when the variable perceptions of risk was added (model VII), did the use of drugs and alcohol fail to exert a direct effect. This pattern is suggestive of the moderating role perceptions of risk play on the relationship that use of alcohol and/or drugs maintains with the HIV-safe behavior. The same can be said about the role of social subjective norms; once self-efficacy perceptions were added, perceptions of social norms were not found to exert a significant effect on use of condoms. The factors that contributed the most to explain condom use were, in order of importance: a) self-efficacy perceptions, and b) perceptions of risk. The model predicted that a unit change in self-efficacy increased the probability of systematic use of condoms by 41.0 percent ($\blacktriangle P = .41$). On the other hand, students who thought they had little risk of contracting HIV were 15.0 percent ($\blacktriangle P = -.15$) less likely to use condoms.

Insert Table 3

Discussion

This study sought to examine the extent to which college students who are sexually active engage in HIV-safe behaviors. A series of hierarchical logistic regression analyses were used to more fully examine the effect of background characteristics, socioeconomic status, alcohol or drugs

use, and perceptual and motivational factors on the probability of adopting HIV-safe behavior. The selection of these factors was guided by current epidemiological research as well as by cognitive and social learning theories as they have been applied to the study of sexual behavior among adolescents and young adults.

Our findings indicate that most residential college students are sexually active. And yet, they are not likely to adopt HIV-safe behaviors such as consistent use of condoms and avoidance of alcohol or drugs in situations that might lead to sexual intercourse. Our results also indicate that the adoption of HIV-safe behavior is independent of demographic characteristics and socioeconomic status. It is evident that college students are quite knowledgeable about how HIV/AIDS is transmitted and what preventive measures can be adopted; however, this knowledge has no influence on a college student's decision to systematically use condoms during sexual intercourse. Rather such perceptual and motivational factors as perceptions of risk and self-efficacy perceptions dominate the decision to adopt the HIV-safe behavior; of the two, self-efficacy perceptions exert the strongest effect.

The fact that background and socioeconomic variables--race, gender, parental education level and family income--were not significantly associated with the probability that an undergraduate would use condoms consistently is encouraging. Or, rather, the opposite would have been discouraging, since these are obviously variables over which college administrators and health professionals have no influence. Less encouraging is the failure of information about AIDS to increase the probability that a student would use condoms. This does not mean, however, that knowledge has no influence. Rather, our findings suggest that the self-perceived ability to act (or self-efficacy perceptions) upon such knowledge is key for understanding the

adoption of the HIV-safe behavior.

The lack of an effect of knowledge of HIV and the negative relationship between perceptions of risk and adopting the HIV-safe behavior suggest possible parallels with some thinking in deterrence theory. In this respect, perceptions of the likelihood of contracting a disease can be seen as similar to beliefs about the odds of being arrested, while assessments of the gravity of the disease can be seen as comparable to those concerning the severity of the punishment. In brief, the perceived likelihood of getting caught is often more important for deterring criminal behavior than is the knowledge of the harshness of the punishment if convicted. In like manner, while people are fully aware of the drastic consequences of contracting HIV/AIDS, they do not think they will "get caught' (i.e., their risk perceptions are low). These perceptions, when combined with low self-efficacy (e.g. believing that it would be hard to persuade a sexual partner to use condoms), lead to unsafe sexual behavior.

From a practical perspective, our results seem to suggest that programs merely stressing cognitive factors pertaining to how HIV/AIDS is transmitted appear not to be the answer. Medical and epidemiological knowledge is already widespread, not only among college students, but in the general adult population as well (see Laumann, Gagnon, Michael & Michaels, 1994). This does not mean the educational efforts disseminating this information should be abandoned. Rather, we recommend that intervention strategies should change focus by making the college students aware of the fact that nobody is free of risk of contracting HIV, while increasing their self-perceived ability to engage in HIV-safe behaviors.

The finding that self-efficacy has the strongest effect on condom use leads us to recommend intervention strategies that stress these attitudes the most. This advice is also

consistent with recent research. Basen-Engquist (1994) found that college students who participated in a workshop designed to increase HIV-preventive behavior by addressing self-efficacy perceptions reported higher increases in self-efficacy perceptions as well as in frequency of condom use as compared to those college students who participated in traditional lectures stressing information on HIV. Bandura (1977, 1992) argues that self-efficacy perceptions are part of a cognitive process that takes place in a social context. It stands to reason, then, to conclude that interventions stressing cognitive-behavioral groups rather than individual instruction would be more likely to enhance self-efficacy. Some evidence seems to support this emphasis on groups. For instance, St. Lawrence and associates (1994) found that group based strategies[11] increased positive attitudes towards condoms, enhanced self-efficacy, brought about greater recognition of HIV vulnerability and reduced sexual activity in high risk contexts among substance dependent adolescents. Similar results were reported by Kelly and associates (1994) for a group of high-risk women in urban clinics.

Generalization of this study's findings about HIV-safe behaviors among college students should be approached with caution. This study is limited by being based on a single type of institution, a predominately White public university and by sampling from one category of college students, residential undergraduate students. Until this study is replicated in other types of institutions and includes other kinds of college students, this study's findings should be regarded as exploratory of the factors leading college students to adopt HIV-safe behaviors.

In spite of these limitations, several factors contributed to enhance the internal validity

---

[11]These methods stressed: a) social competency skills -sexual assertion, partner negotiation and communication skills-, b) problem solving, c) role playing of behaviors to resist high-risk coercions, and d) skills training in condom use.

of the study. More so than in previous research, this study builds upon conceptual frameworks germane to the study sexual behaviors among adolescents and young adults. Our findings also promise to be more representative of the target population since they are based on residential college students; with some exceptions (e.g. Basen-Engquist, 1994; Grimley et al., 1994; MacDonnald et al. 1990), research has overlooked sexual behaviors among college students. While the bulk of the studies are descriptive, this study relied on powerful techniques to uncover the associations between relevant predictors and the criterion measure. In addition, several strategies were employed to enhance the content validity of the instrument (e.g. pilot studies, interviews with experts) which led to scales with acceptable reliabilities. As to the external validity of the study's findings is concerned, it is also important to note that our results are remarkably consistent with those of the most recent and extensive national survey on sexual practices in the United States (Laumann et al., 1994). Although Laumann and associates did not include college students living in dormitories, the trends they documented strikingly resemble the ones reported in this study. Laumann and associates found that among 18 to 24 year olds some 21 percent to 47 percent reported always using condoms during intercourse --our figure of 37.6 percent was half way between. As we did, Laumann and associates found only small differences by income, gender or by knowledge of how HIV/AIDS is transmitted. While they found some ethnic differences (African-Americans were more likely to use condoms), the associations were at best modest although probably significant in view of their large sample size.

Whatever limited this study might be, the point it conveys for college administrators and policy makers is clear: demographic and socioeconomic status do not predict safe sex. Nor does basic education concerning the biology of the disease. Knowledge and skills are needed;

however, decisions to act upon such a knowledge are driven not by epidemiology but by social forces. In this context, college administrators at residential campus can have an impact in the extent to which the programs they enact address students' interpersonal skills and their self-perceived ability to initiate and persist in strategies that lead to the adoption of HIV-safe behaviors.

REFERENCES

Ajzen, I. and Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliffs, N.J.: Prentice Hall.

Aldrich, J. H. and Nelson, F. D. (1986). Linear probability, logit and probit models (3th edition). Beverly Hills, CA.: Sage Publications.

Aldrich, J. H. and Nelson, F. D. (1986). Linear probability, logit and probit models (3th edition). Beverly Hills, CA.: Sage Publications.

Bandura, A. (1992). Social cognitive approach to the exercise of control over AIDS infection. In R. DiClemente (Ed.), Adolescents and AIDS: A generation in jeopardy. Newbury Park: Sage Publications.

Bandura, A. (1977). Social learning theory. Englewood Clifs. N.J.: Prentice Hall Inc.

Basen-Engquist, K. (1994). Evaluation of a theory-based HIV prevention intervention for college students. AIDS Education and Prevention, 6(5), 412-424.

Basen-Engquist, K. and Parcel, G. (1992). Attitudes, norms and self-efficacy: A model of adolescents' HIV-related sexual risk behavior. Health Education Quarterly, 19(2), 263-277.

Boyer, C. and Kegeles, S. (1991). AIDS risk and prevention among adolescents. Social Science Quarterly, 19(2), 263-277.

Brown, L. K., DiClemente, R. J. and Reynolds, L. (1991). HIV precention for adolescents: The utility of the Health Belief Model, ADIS, Education and Prevention, 3(1), 50-59.

Cabrera, A. F. (1994). Logistic regression analysis in higher education: An applied perspective. In J. C. Smart (Ed.). Higher Education: Handbook for the Study of Higher Education, Vol. 10. New York, NY: Agathon Press.

Carmel, S. (1990). The health belief model in the research of aids related preventive behavior. Public Health Review, 18, 73-85.

Catania, J.A. , Kegels, S.M. and Coates, T.M. (1990). Toward an understanding of risk behvior: An AIDS reduction model (ARRM). Health Education Quarterly, 17(1), 53-72.

Cochran, S.D., Mays, V.M., Ciarletta, J., Caruso, C. and Mallon, D. (1992). Efficacy of the Theory of Reasoned Action in Predicting AIDS-related sexual risk reduction among gay men. Journal of Applied Social Psychology, 22 (19), 1481-1501.

DiClemente, R. J. (1991). Predictors of HIV preventive sexual behavior in a high risk adolescent population: The influence of perceived peer norms and sexual communication on incarcerated adolescents' consistent use of condoms, Journal of Adolescent Health, 12, 385-390.

Fienberg, S. E. (1983). The analysis of cross-classified categorical data (rev. ed.). Cambridge, Ma.: Massachusetts Institute of Technology.

Fishbein, M., O'Reilly, K., Chan, D.K., Wood, R. and Beeker, C. (1992). Attitudinal and normative factors as determinants of gay men's intentions to perform AIDS-related sexual behaviors: A multi-site analysis. Journal of Applied Social Psychology, 22(13), 999-1011.

Fisher, J. D. and Fisher, W.A. (1992). Changing AIDS-risk behavior. Psychological Bulletin, 111(3), 455-474.

Fisher, J. D. (1'988). Possible effects of reference group-based

Fisher, J.D. et al. (1992). Sexual opinion questionnaire. University of Connecticut.

Fisher, J. D. (1988). Possible effects of reference group-based social influence on AIDS-risk behavior and aids prevention. American Psychologist, 42(11), 914-920.

Hanusheck, E. K. and Jackson, J. E. (1977). Statistical methods for social scientists. New York, NY.: Academic Press.

Healton, C.G. (1991). In Harm's way: Urban minority youth and the AIDS epidemic. Unpublished doctoral dissertation. N.Y.: Columbia University.

James, N. J., Gillies, P. A. and Bignell, C. J. (1991). AIDS related risk perceptions and sexual behavior among sexually transmitted disease clinic attenders. International Journal of STD and AIDS, 2, 264-271.

Jemot, J. B., et al., (1992). Self-efficacy, hedonistic expectancies, and condom-use intentions among inner-city Black adolescent women: A social cognitive approach to AIDS risk behavior. Journal of Adolescent Health, 13, 512-519.

Jurich, J. A., Adams, R.A. and Schulenberg, J. E. (1992). Factors related to behavior change in response to AIDS. Family Relations, 41, 97-103.

Kelly, J. A., Murphy, D.A., Washington, D.C., et al. (1994). The effects of HIV/AIDS intervention groups for high-risk women in urban clinics. American Journal of Public Health, 84(12), 1918-1922.

Kipke, M. and Hein, K. (1990). Acquired immune deficiency syndrome in adolescents. Adolescent Medicine: State of the Art Review, 1, 429-449.

Lauman, E., Gragnon,J., Michael, R. and Michaels, S. (1994). The social organization of sexuality: Sexual practices in the United States. Illinois, Chicago: University of Chicago Press.

MacDonald et al. (1990). High risk STD/HIV behavior among college students. Journal of the American Medical Association, 263 (23), 3155-3159.

Maddala, G. S. (1987). Limited-dependent and qualitative variables in econometrics (rev. ed.). Cambridge, MA.: Cambridge University Press.

Main, D.S., Iverson, D.C. and McGloin (September/October, 1994). Comparison of HIV-risk behaviors and demographics of adolescents tested or not tested for HIV infection. Public Health Reports, 109(5), 699-702.

Peruga, A. and Rivo, M. (1992). Racial differences in AIDS knowledge among adults. AIDS Education and Prevention, 4, 52-60.

Petersen, T. (1985). A comment on presenting results from logit and probit models. American Sociological Review, 50(1), 130-131.

Press, S. J. and Wilson, W. (1978). Choosing between logistic regression and discriminant analysis. Journal of the American Statistical Association, 73(364), 699-705.

Rosentock, I., Strecher, V. and Vecker, M. (1988). Social learning theory and the health belief model, Health Education Quarterly, 15 (2), 175-183.

Sexual behavior among high school students (1992). Morbidity and Mortality Weekly Report, 40, 51-52.

St. Lawrence J. S., Jefferson, K.W., Banks, P.G., et al. (1994). Cognitive-behavioral intervention to assist substance-dependent adolescents in lowering HIV infection risk. AIDS Education and Prevention, 6(5), 425-435.

Ward, M.C. (1989). Cupid's touch: The lessons of the family planning movement for the AIDS epidemic. The Journal of Sex Research, 25, 289-305.

Wasserheit, J. N. and Ehrhardt, A. A. (1991). Age, gender and sexual risk behaviors for sexually transmitted diseases in the United States. In J. N Wasserheit, S. O. Aral and K.K. Holmes (Eds.). Research issues in human behavior and sexually transmitted diseases in the AIDS era.

Table 1. Descriptive statistics

Variable	N	%	# of items	Mean	S.D.	Reliability
Condom Use						
1. Yes	80	37.6	--	--	--	--
0. No	133	62.4	--	--	--	--
Drugs/Alcohol						
1. Yes	134	63.8	--	--	--	--
0. No	76	36.2	--	--	--	--
Gender						
1. Male	110	50.7	--	--	--	--
0. Female	107	49.3	--	--	--	--
Ethnicity						
1. White/Asian	163	75.8	--	--	--	--
0. Other	52	24.2	--	--	--	--
Parental Education	211	97.2	--	2.84	1.12	--
1. High School or less	38	18.0	--	--	--	--
2. Some College	37	17.5	--	--	--	--
3. College Degree	56	26.5	--	--	--	--
4. Graduate Studies	80	37.9	--	--	--	--
Family Income	207	95.3	--	4.62	1.80	--
1. less than $9th	5	2.4	--	--	--	--
2. $10th - $29.9th	17	8.2	--	--	--	--
3. $30th - $49.9th	39	18.8	--	--	--	--
4. $50th - $69.0th	50	24.2	--	--	--	--
5. $70th - $84.5th	32	15.5	--	--	--	--
6. $85th - $99.9th	22	10.6	--	--	--	--
7. $100th - $149th	28	13.5	--	--	--	--
8. $150th or more	14	6.8	--	--	--	--
Knowledge of HIV	214	98.6	9	7.21	0.84	0.81[1]
Subjective Norms	204	94.0	4	3.54	0.63	0.63[2]
Risk Perceptions	214	98.6	4	1.83	0.69	0.75[2]
Self-Efficacy	201	92.6	6	3.42	0.58	0.72[2]

1. Kuder-Richardson-20 reliability index.
2. Alpha reliability index.

Table 2. Degree of Association between Use of Condoms and Relevant Factors

Variable	Percent of Condom Use	X^2, *df*	Correlation with Condom Use
Drugs/Alcohol	30.8	7.443,1**	-.30** (1)
Gender		.113,1	-.04 (1)
1. Males	36.4		
0. Females	38.7		
Ethnicity		.048,1	-.03 (1)
1. White/Asian	37.5		
0. Other	39.2		
Parental Education		1.559,3	-.00 (1)
1. High School	40.5		
2. Some College	38.9		
3. College	30.4		
4. Graduate Stds.	39.7		
Family Income		7.875,7	.09 (1)
1. Less than $9th	40.0		
2. $10th - $29.9th	47.1		
3. $30th - $49.9th	36.8		
4. $50th - $69.0th	32.0		
5. $79th - $84.5th	29.0		
6. $85th - $99.9th	33.3		
7. $100th - $149th	48.1		
8. $150th or more	64.3		
Knowledge of HIV	NA	NA	-.05 (1)
Subjective Norms	NA	NA	.21* (1)
Risk Perceptions	NA	NA	-.35** (1)
Self-Efficacy	NA	NA	.44** (1)

NA: Not applicable, 1: Polychoric correlation
*Significant at .05; **significant at .01

Table 3. Hierarchical fitting process.

	Model Fitting			Goodness of Fit for the Model			
Variable(s)	G^2	df	X^2 change	X^2, df	PCP	G^2/df	Pseudo-R^2
Drugs/Alcohol	226.01	171	5.83*	5.83,1*	61.9	1.32	0.03
Background	225.95	170	0.06	5.91,3	62.4	1.33	0.03
SES	225.44	168	0.51	6.38,5	61.3	1.34	0.04
Knowledge	225.46	167	-0.02	6.40,6	61.9	1.35	0.04
Norms	215.83	166	9.62*	16.02,7*	65.9	1.30	0.08
Risk	206.54	165	9.30*	25.32,8**	71.1	1.25	0.13
Self-Efficacy	188.38	164	18.15**	43.47,9**	71.7	1.15	0.20

* Significant at .05 level
** Significant at .01 level

TABLE 4. Hierarchical Logistic Regression Results.
Effects of Background, SES and psychological factors on Condom Use

Variable	(I) Drugs/Alcohol (Beta)	▲P	(II) Background (Beta)	▲P	(III) SES (Beta)	▲P	(IV) Knowledge (Beta)	▲P	(V) Norms (Beta)	▲P	(VI) Risk (Beta)	▲P	(VII) Self-Efficacy (Beta)	▲P
Drugs/Alcohol	-0.786*	-0.161	-0.806*	-0.164	-0.802*	-0.163	-0.805*	-0.164	-0.727*	-0.151	-0.444	-0.097	-0.499	-0.108
Male			0.054		0.032		0.032		0.308		0.221		0.694	
White/Asian			0.073		0.058		0.061		-0.023		-0.165		-0.237	
Family Education					-0.051		-0.056		-0.109		-0.128		-0.130	
Family Income					0.066		0.068		0.036		0.043		-0.020	
Knowledge							-0.033		-0.111		-0.096		-0.032	
Norms									0.954**	0.234	0.863**	0.212	0.281	
Risk											-0.819**	-0.166	-0.722**	-0.150
Self-Efficacy													1.809**	0.410
Intercept	0.0667*		-0.006		-0.145		0.102		-2.597**		-0.931		-5.639*	
X^2, df	5.83,1*		5.91,3		6.38,5		6.40,5		16.02,7*		25.32,8**		43.47,9**	